

Claims

1. A process for preparing a high-concentration formaldehyde solution by removing water from a lower-concentration formaldehyde solution having a formaldehyde content of from 5 to 50% by weight, in which the lower-concentration formaldehyde solution is fed to a preheater and heated in the preheater, depressurized via a pressure maintenance device and concentrated in a helical tube evaporator to give a vapor stream and the high-concentration formaldehyde solution as bottom stream, wherein the heated lower-concentration formaldehyde solution is depressurized in the pressure maintenance device to give a two-phase mixture which is fed into the helical tube evaporator.
2. The process according to claim 1, wherein the high-concentration formaldehyde solution in the bottom stream of the helical tube evaporator contains at least 70% by weight of formaldehyde, preferably at least 75% by weight of formaldehyde.
3. The process according to claim 1 or 2, wherein a stripping gas, preferably nitrogen, is mixed into the two-phase mixture before it is fed into the helical tube evaporator.
4. The process according to any of claims 1 to 3, wherein a stabilizer, in particular methanol, ethanol, a propanol, a butanol, urea or melamine, is introduced into the two-phase mixture before it is fed into the helical tube evaporator.
5. The process according to any of claims 1 to 4, wherein a wavy film flow is established in the helical tube evaporator by appropriate choice of the geometry of the evaporator and also of the operating conditions, in particular the total mass flow and the gas content of the two-phase mixture which is passed through the helical tube evaporator.
6. The process according to any of claims 1 to 5, wherein devices for achieving intensive mixing of the two-phase mixture, in particular valves, flow restrictors, ribs or knitted wire meshes, are provided in the helical tube evaporator.
7. The process according to any of claims 1 to 6, wherein the vapor stream from the helical tube evaporator is partially or completely condensed in a condenser, preferably a surface condenser, particularly preferably in a quench condenser.
8. The process according to claim 7, wherein the condensed part of the vapor stream is recycled to the preheater.

9. The process according to any of claims 1 to 8, wherein all or part of the bottom stream from the helical tube evaporator is recycled to the preheater.